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| 10/605,797 | 10/28/2003 | Santanu Basu | B-03-0192 | 2796 |

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| EXAMINER |
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PRITCHETT, JOSHUA L

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| ART UNIT | PAPER NUMBER |
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2872

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/605,797

Applicant(s)

BASU, SANTANU

Examiner

Joshua L. Pritchett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 13-17 and 33-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 18-32, 43 and 44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This action is in response to Amendment filed January 21, 2006. Claims 1, 2, 18, 24, 26-28 and 30 have been amended and claims 43 and 44 have been added as requested by the applicant.

Specification

The disclosure is objected to because of the following informalities: the disclosure states that the following elements are optional a front grapple (para. 0031), a guide (para. 0037), a rear grapple (para. 0035) and a tertiary mirror (para. 0023). These elements are now required by the claim language and therefore are no longer optional. The examiner considers the elements as lacking criticality because they were originally disclosed as being optional and therefore are not critical to the functionality of the applicant's invention.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-12, 18-20, 22 and 24-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenell (US 5,157,556).

Regarding claims 1, 18 and 30, Hugenell teaches an optical structures including an optical beam path forming a plurality of interlocking modular segments (9), each of the plurality of interlocking modular segments comprising a plurality of interlocking attachments (12 and 18) and a plurality of members (21), wherein each of the plurality of interlocking attachments is coupled to at least one of the plurality of members and wherein each of the plurality of members is coupled to at least one of the plurality of interlocking attachments (Fig. 4; col. 5 lines 27-35); forming a modular mirror backing structure (16) from the plurality of interlocking modular segments interlocking at least two of the mirror backings (Fig. 1); coupling the modular mirror backing to the foundation (Fig. 4); coupling a plurality of modular segmented optics one at a time to the modular mirror backing structure to form a primary mirror having a central hole (19; Fig. 1); and coupling a secondary mirror to the modular mirror backing structure, wherein the secondary mirror is operatively coupled to the primary mirror and is operatively coupled through the central hole (col. 1 lines 25-26). Hugenell teaches a Cassegrain telescope system which couples a secondary mirror in the claimed manner to a primary mirror. Hugnell lacks reference to the use of a satellite. Hugenell does teach the use of the telescope in space (col. 2 lines 10-11). It is extremely well known in the art to have telescopes used in space attached to satellites. Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time

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the invention was made to have the telescope of Hugenell attached to a satellite for the purpose of viewing a planet from an orbiting position.

Regarding claims 2, 9, 11, 24 and 31, Hugenell teaches forming a plurality of modular segmented optics wherein each of the plurality of modular segmented optics comprises a front reflecting surface, a backside, a plurality of side surfaces defined by the front reflecting surface and the back side (Fig. 2), a flexible center attachment (17) coupled to the backside (Fig. 4), a plurality of actuator attachments (14 and 15) coupled to the backside (Fig. 4); a guide (21) attached to the backside (Fig. 4); a rear grapple (12) attached to the backside, coupling the flexible center attachment of a first one of the plurality of modular segments to a top region of the interlocking attachments (Fig. 4) and coupling the plurality of actuators attachments to one of the plurality of modular segmented optics to a respective top region of another of the interlocking attachments (Figs. 2 and 4), repeating the coupling steps, wherein a first side surface of the first one of the plurality of modular segmented optics substantially abuts an adjacent side surface of the adjacent one of the plurality of modular segmented optics and such that the front reflecting surface of the first one of the plurality of modular segmented optics forms a continuous surface with the front reflecting surface of the adjacent one of the plurality of modular segmented optics (Figs. 1 and 4; col. 5 lines 27-43). Hugenell lacks specific reference to a front grapple coupled to the front reflecting surface. It is extremely well known in the art to have a grapple attached to the front reflecting surface of a mirror to allow positioning of the mirror. Official Notice is taken. Furthermore this element lacks criticality. The applicant's specification states in paragraph 0031 that the front grapple is optional, therefore it is not essential to functionality of the applicant's invention. It would have been obvious to one of

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ordinary skill in the art at the time the invention was made to have the Hugenell invention include a front grapple for the purpose of positioning the mirror or removal of the mirror for cleaning or replacement in addition to allowing assembly without touching the front reflecting surface.

Regarding claims 3 and 20, Hugenell teaches forming a modular mirror backing structure from the plurality of interlocking modular segments comprises coupling a first end of one of the plurality of members of one of the plurality of interlocking modular segments within a first side slot of one of the plurality of interlocking modular segments (Fig. 1). Fig. 1 shows that except for opening 19 there are not gaps between the modular segmented optics. Hugenell further teaches introducing a first end of another one of the plurality of members of the one of the plurality of interlocking modular segments within a first side slot of a third one of the plurality of interlocking modular segments (Figs. 3 and 4; col. 5 lines 27-35).

Regarding claims 4, 8, 10 and 19, Hugenell teaches providing a plurality of interlocking attachments, each of the plurality of interlocking attachments having a top region (18) and a plurality of side slots (12); providing a plurality of members (21) having a first end and a second end (Fig. 2); introducing a first end of one of the plurality of members within a first side slot of one of the plurality of interlocking attachments (Fig. 4); introducing a second end of one of the plurality of members within a first side slot of a second one of the plurality of interlocking attachments (Fig. 4) and introducing a first end of another of the plurality of members within a second side slot of the first one of the plurality of interlocking attachments (col. 5 lines 27-35).

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Regarding claims 6, 7 and 22, Hugenell teaches introducing the outermost end of the plurality of members defining the outer periphery within a corresponding inner side slot of an edge truss (1-8; Fig. 1).

Regarding claims 12 and 29, Hugenell teaches coupling the protruding region with a top surface of the at least one interlocking attachment such that each of the arms coupled over a respective one of the plurality of actuator elements is seated onto at least one of the plurality of members (Fig. 4).

Regarding claim 25, Hugenell teaches repeating the coupling procedure for a plurality of modular segmented optics (col. 5 lines 27-43).

Regarding claims 26 and 27, Hugenell teaches the claimed invention except for automating the assembly procedure of the modular segmented optics. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a machine perform the assembly of the modular segmented optics, since it have been held that broadly providing a mechanical or automatic means to replace manual activity which accomplishes the same result involves only routine skill in the art. One would have been motivated to automate the assembly process in order to allow the mirror to be assembled in space without the use of an astronaut.

Regarding claim 28, Hugenell teaches forming a plurality of modular segmented optics wherein each of the plurality of modular segmented optics comprises a front reflecting surface, a backside, a plurality of side surfaces defined by the front reflecting surface and the back side (Fig. 2), a flexible center attachment (17) coupled to the backside (Fig. 4), a plurality of actuator attachments (14 and 15) coupled to the backside (Fig. 4), providing a plurality of multi-arm

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guides (13) wherein each of the plurality of multi-arm guides comprises a central hub having an inlet region and a protruding region and a plurality of arms (12) extending radially from the central hub (Fig. 3); introducing the center attachment of one of the plurality of multi-arm guides within an inlet region of a multi-arm guide such that the plurality of arms are coupled over a respective one of the plurality of actuator attachments (Fig. 4); coupling the multi-arm guide of a first one of the plurality of modular segmented optics to a top region of one of the interlocking attachments (Fig. 4); repeating the coupling steps, wherein a first side surface of the first one of the plurality of modular segmented optics substantially abuts an adjacent side surface of the adjacent one of the plurality of modular segmented optics and such that the front reflecting surface of the first one of the plurality of modular segmented optics forms a continuous surface with the front reflecting surface of the adjacent one of the plurality of modular segmented optics (Figs. 1 and 4; col. 5 lines 27-43).

Regarding claim 32, Hugennell teaches the one of the integrated modular segments is coupled to another of the integrated modular segments using an external coupler (Figs. 1 and 4).

Regarding claims 43 and 44, Hugennell teaches the invention as claimed but lacks reference to a tertiary mirror. It is extremely well known in the art to have a nested Cassegrain mirror system, which would include a tertiary mirror, for the purpose of correcting for aberrations in the collected image. Official Notice is taken. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Hugennell reference include a tertiary mirror as is well known in the art for the purpose of correcting for aberrations in the image to provide a more coherent image to the image recorder or observer.

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Claims 5, 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugenell (US 5,157,556) in view of Callender (US H783).

Hugenell teaches the invention as claimed but lacks specifics about the secondary mirror. Callender teaches a Cassegrain telescope coupling the secondary mirror the mirror backing structure comprising providing at least one support connector (21), each of the at least one support connectors having an inner end and an outer end (Fig. 1); coupling an outer end of each of the at least one support connector to an outer side surface of the secondary mirror (13; Fig. 1); coupling an inner end of each of the at least one support connector to a respective attachment defining an outer periphery of the modular mirror backing (20; Fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Hugenell invention include the secondary mirror coupling as taught by Callender for the purpose of precisely securing the secondary mirror to accept light passing through the central hole of the telescope.

Response to Arguments

Applicant's arguments filed January 21, 2006 have been fully considered but they are not persuasive.

Applicant argues that the Hugenell reference fails to show mirrors that are interlocked. The term interlock is defined as connected so that the motion or operation of any part is constrained by another. The applicant admits the mirrors shown in Fig. 1 abut one another. Therefore the mirrors are constrained from any motion in the plane of the mirror. Further the

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Hugenell reference suggests that the mirrors are further connected by saying the outer mirrors are “joined” to the inner mirrors (col. 5 lines 1-3). The Hugenell reference satisfies the broadest reasonable interpretation of the term interlock.

Applicant wishes for clarification of why claim 33 was included in the rejection with claims 5 and 21. The rejection included claim 23, not 33, with claims 5 and 21. The applicant withdrew claim 33 from consideration following the election of invention.

Applicant argues that Callendar fails to teach the mirrors interlocking. As stated above Hugenell teaches the interlocking feature.

Applicant’s arguments, see Amendment, filed January 21, 2006, with respect to objection to claims 18-32 have been fully considered and are persuasive. The objection of claims 18-32 has been withdrawn.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLP 


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SUPERVISORY PATENT EXAMINER